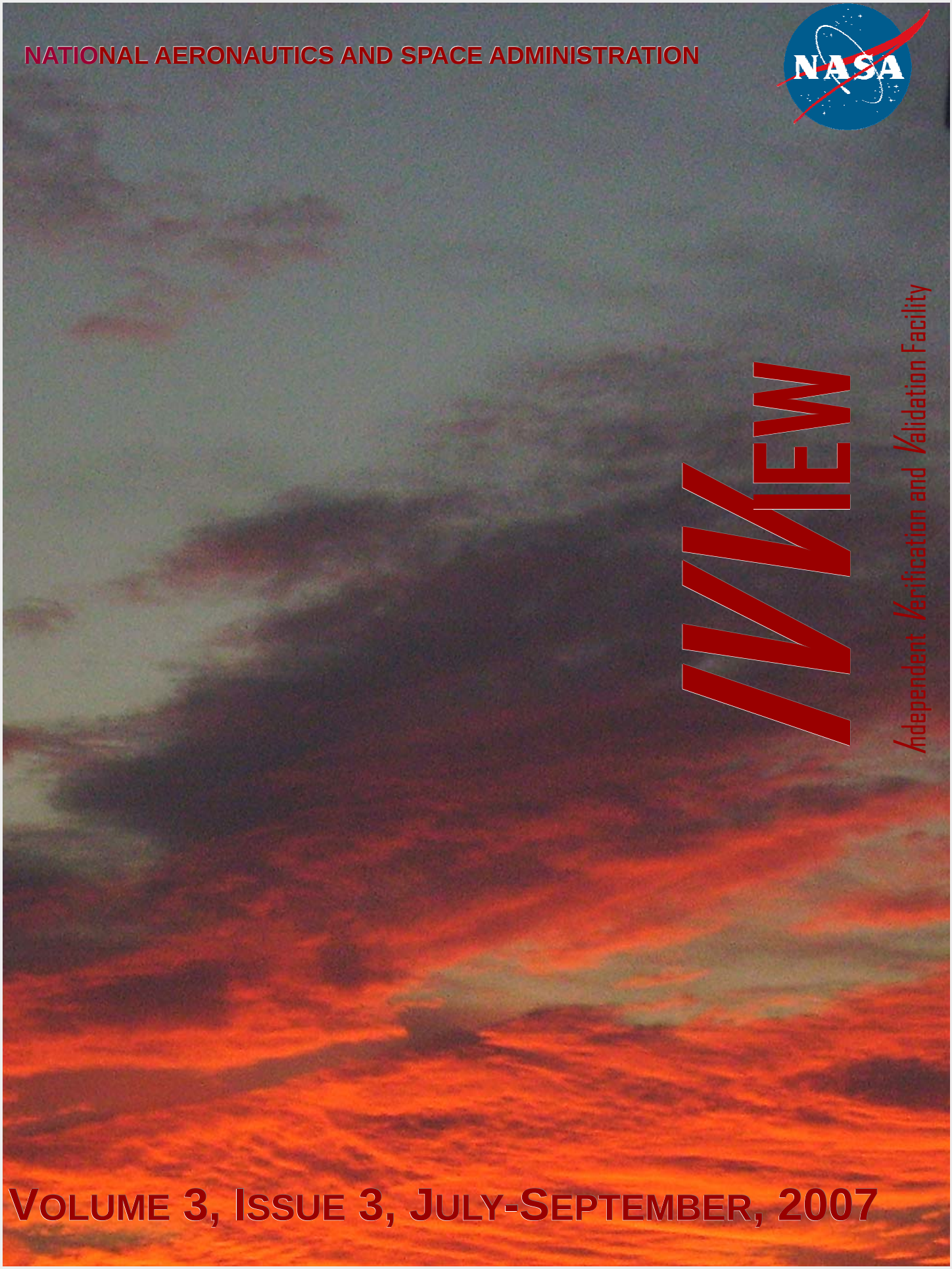

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

IVVIEW

Independent Verification and Validation Facility

VOLUME 3, ISSUE 3, JULY-SEPTEMBER, 2007

Director's Point of VIEW....

Summer has come to an end with a flurry of activity at IV&V.

We proudly welcomed our Administrator to the Facility; began a new mentoring program; offered our first Workshop on Validation; hosted a couple of hundred researchers and NASA officials at the seventh annual SAS; helped to host the first of our Combined Federal Campaign events with Congressman Alan Mollohan; offered a once-in-a-lifetime opportunity to 900-plus seventh graders; and spent a beautiful summer day together celebrating our IV&V "family."

With all that going on, the Services we provide to our Agency continued apace, while we completed internal restructuring designed to support a more vigorous validation approach.

Autumn has arrived and, with it, the first quarter of the new fiscal year and the last quarter of the calendar year. The beginning of the fiscal year leads me to encourage you to continue to hone your stewardship skills and help us keep our budgetary belts tightened. The end of the calendar year leads me to encourage you to open your hearts and wallets to the needs of your neighbors—local and global—by supporting this year's Combined Federal Campaign.

I am confident we will begin and end well, having come to know the good work and great generosity of our IV&V family.

Sincerely,

Dr. Butch Caffall
Director, NASA IV&V Facility

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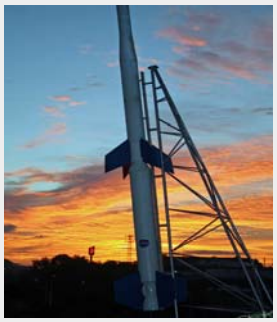


Cover Photo : Just one of the reasons why it's great to work for NASA in West Virginia. Front cover is a view of the dawning of the sun over IV&V. Photo to the left was taken just a few minutes later. These are the kind of views that can get your heart singing. Almost heaven—West Virginia, indeed.

Photo credits: Steve Pukansky —IV&V early riser.

Please submit news items and/or photos to Kathleen.M.Millson@nasa.gov; 304-367-8445.
All submissions are subject to editing.

Next Submission Deadline: December 10, 2007

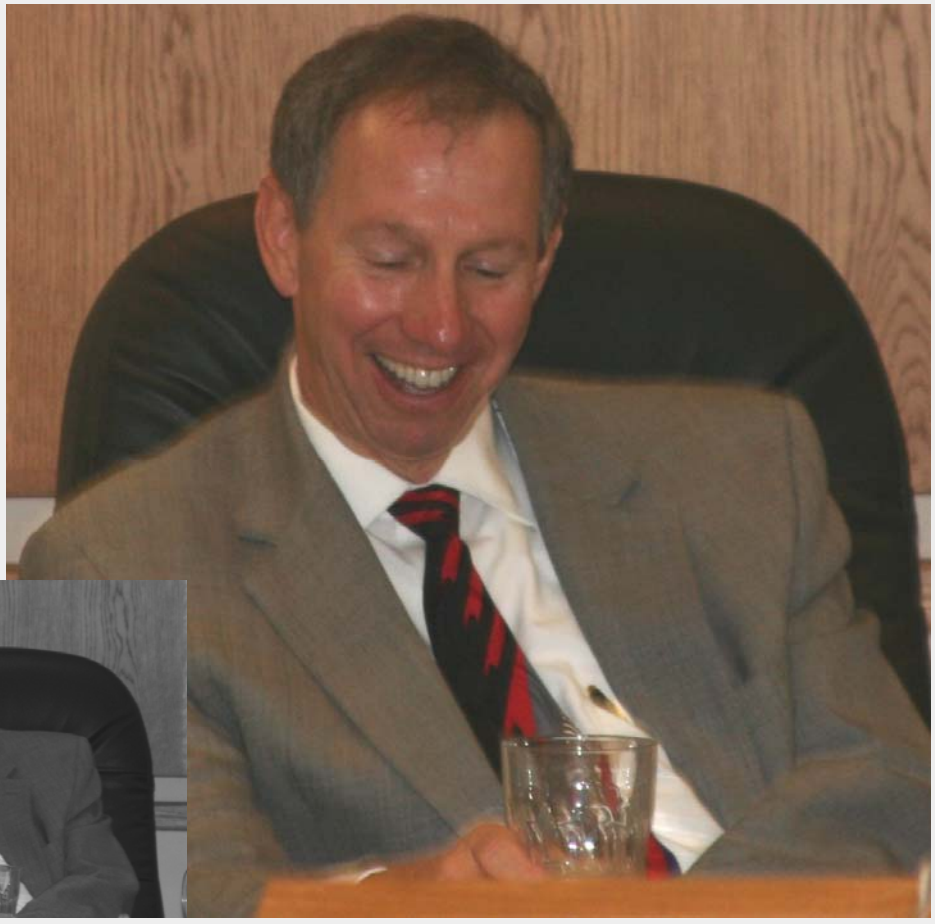
Managing Editor: Donna Ozburn Editor: Kathleen Millson

NASA Administrator, Mike Griffin, Conducts All-Hands at IV&V in August

IV&V was proud to host NASA Administrator, Mike Griffin, in August for his first tour of the Facility. The Administrator, accompanied by Office of Safety and Mission Assurance Chief, Bryan O'Connor, and a retinue of Headquarter guests, were presented with an overview of the work conducted on behalf of the Agency by the IV&V Program, its project managers and contractors.

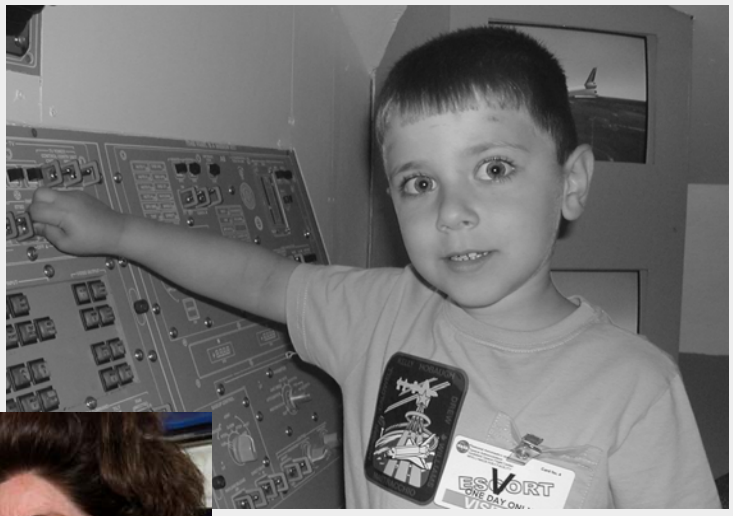
A tour of the Facility and a series of topical meetings took place, followed by a standing-room only All-Hands conversation with the Administrator. Questions covered the gamut from budgetary constraints, to the technical role that he perceived IV&V's mission of software assurance and safety plays in NASA's current and future missions, to NASA 's tradition of endeavoring to inspire and motivate young people to pursue careers in the fields of science, math and technology.

The Administrator was candid. The dialogue was lively. Dr. Griffin's long-awaited visit was a great success, and IV&V hopes it will not be his last.



Hands-On Experience

Brendan Gibat



Left to Right: NASA Administrator, Mike Griffin, lands the Shuttle in IV&V's student-built Simulator; the real thing—successful landing -STS 118 and NASA Teacher Astronaut Barbara Morgan; Future Astronaut, Joseph Grower, also made a successful landing (with just a little help) during his visit to IV&V this summer.

When Administrator, Mike Griffin, toured the IV&V Facility, one of his stops was the Shuttle Simulator. Taking over the controls, he offered recommendations to improve upon the hands-on experience while making a successful landing. Jess White, the IV&V Student Outreach program manager, enjoyed a conversation with Dr. Griffin about how to balance realism versus ease-of-use, as this particular simulator was specifically designed to enable kids as young as five-years old to successfully land the shuttle.

Originally designed by Phil Merritt and Aaron Wilson, and later by Dan Nawrocki, on several commodity PC's, the Shuttle Simulator now utilizes several projectors, video panels, and a mock up of the shuttle flight deck. This reflects the hard work of student interns, both college and high school, to implement an array of features that the Facility's outreach program can use to show students, educators and community groups the excitement of being in the Science, Technology, Engineering, Mathematics (STEM) fields.

Currently the shuttle simulator implements a shuttle landing simulation, both autonomous and controlled, and shuttle docking simulation with the International Space Station (ISS). Additionally, these simulations can be run in both combined and stand-alone modes, allowing for students to try their hand on both simulations simultaneously.

To further improve upon the experience, student interns from high schools in the area implemented video panel displays that integrate with the flight control software of the shuttle landing simulation to display real time data through virtual flight gauges. These gauges allow for the display of projected landing paths, orientation, attitude, pitch, and other necessary options to make the simulation more realistic to the youth served from the use of the project.

Roger Harris, the current project manager for the shuttle simulator, plans to integrate a landing scenario at Edwards Air Force base, a Hubble servicing mission with the robotic arm aboard the Shuttle, and improved graphics capabilities.

New Horizons on a Straight Path to Pluto

With a slight tweak of its trajectory, New Horizons is headed toward the heart of the distant Pluto system. Starting at 4:04 p.m. EDT on Sept. 25, New Horizons fired its thrusters for 15 minutes and 37 seconds, using less than a kilogram of fuel to change its velocity by 2.37 meters per second, or just more than 5 miles per hour. Monitored from the New Horizons Mission Operations Center at the Johns Hopkins Applied Physics Laboratory (APL) in Laurel, Md., the maneuver was only the fourth trajectory correction for the spacecraft since launch in January 2006, and the first since it sped through the Jupiter system last February. The spacecraft was nearly 727 million miles (1.16 billion kilometers) from Earth during the maneuver – just about halfway between the orbits of Jupiter and Saturn."The burn was right on the money, and everything we had hoped for," says New Horizons Principal Investigator Alan Stern, of NASA Headquarters, Washington. "Our operations team at APL and the navigation team from KinetX really earned their pay. Planet Pluto, here comes New Horizons!"

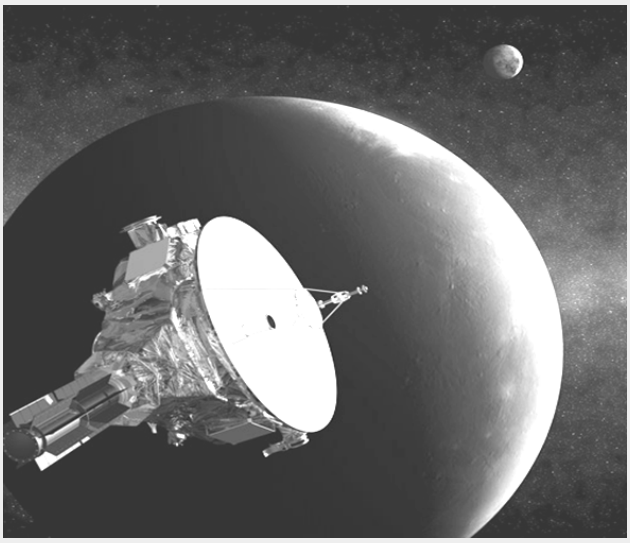


Image Credit NASA JPL

Dawn Launch Mosaic

At Cape Canaveral Air Force Station, the Dawn spacecraft began its journey to the asteroid belt, arcing eastward into a blue and cloudy sky. Dawn's voyage began on a conventional, chemically fueled Delta II rocket, but will continue with an innovative ion propulsion system. The spacecraft's extremely efficient ion engines will use electricity derived from solar power to ionize xenon atoms and generate a gentle but continuous thrust. After a four year interplanetary cruise, Dawn will orbit two small worlds, first Vesta and then Ceres. Vesta is one of the largest main belt asteroids, while nomenclature introduced by the International Astronomical Union in 2006 classifies nearly spherical Ceres as a dwarf planet.

Credit & Copyright: Randy Pollock

Opportunity's First Dip into Victoria Crater

NASA's Mars Exploration Rover Opportunity entered Victoria Crater during the rover's 1,291st Martian day, or sol, (Sept. 11, 2007). The rover team commanded Opportunity to drive just far enough into the crater to get all six wheels onto the inner slope, and then to back out again and assess how much the wheels slipped on the slope. This wide-angle view taken by Opportunity's front hazard-identification camera at the end of the day's driving shows the wheel tracks created by the short dip into the crater. The left half of the image looks across an alcove informally named "Duck Bay" toward a promontory called "Cape Verde" clockwise around the crater wall. The right half of the image looks across the main body of the crater, which is 800 meters (half a mile) in diameter.

Image Credit NASA JPL

SAS 2007: Where Research Becomes Reality

Dylan Jones

Researchers, NASA program and project managers and students packed Waterfront Place Hotel in Morgantown, West Virginia, to showcase software research for NASA's seventh annual Software Assurance Symposium.

The event, which is sponsored by NASA's Office of Safety and Mission Assurance and managed by the NASA Independent Verification and Validation Facility, was held September 25-27, and welcomed participants from all ten NASA Centers and from both the European and Japanese Space Agencies.

Those who attended the event were treated to presentations on cutting-edge software and safety assurance. The research initiatives were presented in two parts at the conference. Morning sessions consisted of executive presentations, which are high-level overviews of the research projects. These presentations defined the researcher's goals, objectives and approaches. Presenters also touched on outstanding results from the projects. New software assurance tools were also highlighted.

NASA Chief Engineer Dr. Michael Ryschkewitsch addresses a packed house of national and international researchers and NASA officials.

During the afternoon sessions, researchers gave technical presentations that elaborated on their research and offered a clear and detailed understanding of their progress and results. The combined effort of researchers and presenters offered an overview of the current state of software and safety assurance to those in attendance.

Bryan O'Connor, NASA's Chief Safety and Mission Assurance Officer and former astronaut, was the keynote speaker for the symposium. NASA Chief Engineer Michael Ryschkewitsch also spoke at the event. The two leaders were present to conduct a joint meeting of their respective boards of advisors followed by separate planning meetings. Board members also participated as guest speakers to the Software Assurance Symposium on select topics.

The symposium is designed to create an atmosphere that encourages collaborations and meetings between attendees to promote further advancements in the field of software and safety assurance.

The traditional SAS Flight Night saw competitive aerial action in the form of customized balsa wood planes. Although the planes are simple in design, teams were allowed to modify their planes by adding more wings and using tape scissors to tailor the curvature of their designs.

Some creations were comprised of two or more planes, and the competition was fierce. A mock runway was set up complete with lights, and a panel of judges offered points for style, distance and design. Flight night closed with a face off between O'Connor's SMA Board and Ryschkewitsch's Engineering Management Board.

SAS 2007: ***Award for Impact*** presented to Valerie Jones

Lisa Montgomery

NASA's Office of Safety and Mission Assurance (OSMA) Software Assurance Research Program (SARP) honored the work of Ms. Valerie Jones. Ms. Jones received the 2007 SAS ***Award for Impact*** for her research effort, **Evaluation of Current Requirements Analysis (RA) Tools Capabilities for IVV in the RA Phase.**

There is much to applaud and encourage others to emulate in the way Ms. Jones conducted this initiative. Her work provided a thorough evaluation of commercially available products, research-developed tools (rather than re-inventing the wheel); and, test cases from current NASA missions so that even her initial evaluation provided information back to the projects that was of value. Ms. Jones achieved significant results in a short time period (as we don't always have the luxury of steady budgets), and functioned as a resource to support the project schedule.

Valerie Jones, 2007 SAS *Award for Impact* recipient, Galaxy Global Corporation; Lisa Montgomery, Research Lead (Acting), NASA IV&V

Most importantly, the tool that is being refined is one that is not only versatile but one that can provide an advantage in assuring the requirements early in a project's lifecycle. This is a tool that can serve not only as a check on manual evaluation, but one that can also find those faults which are easy for humans to miss. In short, this tool can help us do our jobs more thoroughly and with more confidence in our work.

SAS 2007: Dr. Forrest Shull receives ***Award for Persistence***

Lisa Montgomery

Dr. Forrest Shull of the Fraunhofer USA Center for Experimental Software Engineering at the University of Maryland was awarded the 2007 SAS ***Award for Persistence*** for his research efforts over the past five years. Research is rarely a short path, and his efforts have demonstrated concretely that even with the right team with the right contacts, moving from theory to practical application takes time. As research is an uncertain endeavor at best, not every investment in time and effort pays dividends, but Dr. Shull's work is likely to be one of the first, NASA-wide success stories coming out of the SARP.

Dr. Forrest Shull, Fraunhofer USA Center for Experimental Software Engineering, University of Maryland, 2007 SAS *Award for Persistence* recipient

In 2003 his first SARP initiative, ***State-of-the-Art Software Inspections & Reading at NASA***, was ahead of the curve in terns of his approach to communication and tech transfer activities. Follow-up efforts supporting the **Software Engineering Research / Developer Collaborations**, what has become SARP Research Infusion, was work that helped inform updates to the NASA Standards in 2005. His current initiative, ***Full Life-Cycle Defect Management Assessment***, has delivered not only a means for individual projects to demonstrate how they have met elements of the NASA Standards, but also a way to show the benefit of having done so.

Dr. Shull's work will give the Centers, and ultimately the Agency as a whole, the information necessary to make informed engineering decisions about which assurance activities they want to include, how to staff those activities, and the return on investment that can be expected.

A Sea of Seventh Graders

Dylan Jones

Nine hundred seventh grade students from five area middle schools packed the I-79 Technology Park Research Center on September 28th to participate in hands-on scientific experiments and attend a presentation from Astronaut Kenneth D. Cameron for NASA's Day in the Park. The event is designed to inspire young people to become excited about Science, Technology, Engineering and Mathematics (STEM) careers as a response to the national trend in the decline of student interest in STEM careers.

Hosted by the NASA Independent Verification and Validation Facility and the West Virginia High Tech Consortium Foundation, Day in the Park was also supported by a grant from the Robert H. Mollohan Family Charitable Foundation, Inc..

Astronaut Ken Cameron, who has logged 561 hours in space, appeared a giant amongst the sea of seated seventh grade students as he gave a visual presentation and described his experiences in space. In response to dozens of waving hands, he answered the young students' questions for several minutes.

The Carnegie Science Center's Fractured Physics exhibit taught concepts of Newton's Second Law of Motion by showcasing the properties of glass. Students journeyed to a top-secret laboratory where physical properties of glass were demonstrated, and learned about future developments of glass through cutting-edge research. The exhibit "What happens to matter when it gets really hot and really cold?" involved an audience participation game where the Fire Team faced off against the Ice Team in an epic battle involving explosive demonstrations. Elements were brought to their boiling points and items were frozen at 320 degrees below zero in liquid nitrogen. SciWorks presented the Space Race, which was a live, interactive presentation that conducted demonstrations to encourage interest and participation in mathematics and science.

Participating schools included Washington Irving Middle School, West Fairmont Middle School, Bridgeport Middle School, South Middle School and Clay-Battelle Middle School.

Who *Are* Those Guys? Meet the IV&V Educator Resource Center Team

The IV&V Facility, unlike many other sites throughout our Agency, is not a large campus. When there is something afoot, we all quickly become aware. But as small as we are, we still find ourselves too often asking, as Butch asked Sundance, "Who are those guys?" Recently, we asked one of our most successful teams to answer that question.


Program Manager

Todd Ensign, In addition to specializing in secondary education and technology, I am the new Program Manager for the Educator Resource Center (ERC). I am very excited about the many initiatives at the ERC and all the new staff now working on them. We have hired Marcie Rice, a former classroom teacher as our new full-time Elementary Education Specialist and Amy Friend, an elementary education major at Fairmont State, as the new ERC Intern and facility librarian. In addition, we are fortunate to have the assistance of Alicia Crites, a secondary science education major at Fairmont State, and Susan Rodriguez who works at the WVHTCF but is collaborating on a grant-sponsored project with the ERC. Last and not least, the ERC was selected as a host site for an NSF Sponsored fellowship program and we are proud to have Millie Swiger, a teacher at East Fairmont High who is spending her summer working on educational multi-media projects. So, chances are you will run into some of the ERC staff this summer and when you do be sure to introduce yourself, or better yet stop by the ERC sometime and meet the team.


Alicia Crites


Susan Rodriguez


Millie Swiger


Elementary Education Specialist

Marcie Rice A native of the area, I was excited to be able to return here and use my teaching experiences in combination with NASA materials to help West Virginian educators engage students in science, technology, engineering, and mathematics activities. My background as a classroom teacher and an instructor at an outdoor educational facility focused on experiential education give me an understanding of the possibilities and limitations in different educational settings. The Educator Resource Center is not only a great place for educators to find materials for their classrooms, but a place for them to get ideas and learn new content. I am fortunate to work at a place which enables me to grow as I learn and discover new things to share with educators. Outside of what I have been learning on my own, I have participated in training on Pro/Engineer software and recently attended Space Camp for Educators in Huntsville, Alabama. Both of these experiences have given me great ideas I am ready to take to educators so they can reach students around the state. Besides the new, I am learning and leading workshops on some of the old favorites like our Kindernauts Kit, Star-Lab, and Echo the Bat. All of these have materials ready for teachers to use. I hope to work with the entire ERC team to expand our audience and create new workshop topics. Help us get the word out about the great things we offer here in the NASA IV&V ERC!


Librarian

Amy Friend I am a sophomore at Fairmont State University where I am currently working toward a degree in Elementary Education. I was hired by IMTS as an intern in April 2007. Through my internship I am not only the librarian, but I work with the Educator Resource Center (ERC). In this position I help prepare for workshops and organize the NASA resources the ERC has to offer educators in West Virginia. Preparing for a workshop entails putting together packets for the participants of all the materials they will need at the workshop and ones they can use later in their classrooms. This job corresponds perfectly with my degree and my goal of becoming an educator.

IV&V 2007 Family Summer Picnic

Kaci Reynolds

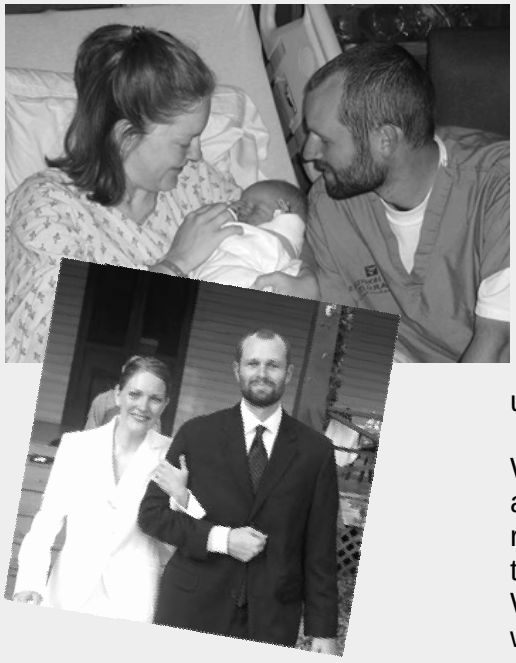
On Saturday, August 25, the IV&V Facility held its annual picnic at Heston's Farm in Fairmont, WV. Although driving out to Heston's seems like you are driving into the middle of nowhere, a total of 186 civil servants, contractors, family and friends found their way—assuring that a good time was had by all.

The event was catered by the Texas Roadhouse Restaurant and by some of IV&V's very own cooks and bakers. The restaurant and our colleagues outdid themselves once again. The food was excellent. Fortunately, the rain held off, giving way to sunshine – and lots of it. As a matter of fact, the thermometer registered at 94 degrees. Including the heat index, it felt like 104!

The kids fun theme this year was Pirates. Thanks to all of those who got into the spirit by adding a little swashbuckle to their attire! The prizes for the kids' games and goodie bags were Pirates of the Caribbean treasures. The activities for kids (both young and old) included a treasure hunt, water-gun battle, fishing, swimming, soccer and the old favorite, designing tie-dyed shirts.

We would like to thank the picnic committee – Debra Radabaugh, Dave Dial and Kaci Reynolds for planning, organizing and working the event. Thanks to those individuals who helped with the set-up and clean-up. A special thanks to Brian Davis for providing a generous donation to enable the tie-dye activity to take place. As always, volunteers to help out next year will be greatly appreciated.

IV&V Family Album



When IV&V decided to expand its engineering team's capacity, the Northey's took the decision very seriously.

William James Northey was born at 7:05 AM on September 20th. Weighing in at 7 pounds, 6 ounces, he measured 20 1/4 inches long.

William is the son of Jeff and Melissa Northey, members of the IV&V engineering team. Regular readers will remember that his parents were featured in the IVView in the fall of 2005 as the first NASA IV&V civil service engineers to marry. We are expanding our capacity from the inside. Study hard William—we're saving a place for you.

Congressman Mollohan Encourages Generosity to 2007 CFC

(The following remarks were offered by Congressman Alan Mollohan at the CFC Kick-Off Luncheon.)

"I am grateful to be with all of you today. As a matter of fact, it has been great to be home this month. I am impressed to learn that the federal employees in the seven counties that make up the local Combined Federal Campaign are performing at such high numbers as contributors to the CFC charities. Your contributions total *three times* the national average of individual giving. This impressive statistic makes me deeply proud to be counted among you.

Cong. Alan Mollohan; CFC Chair and IV&V Plans/Programs Lead, John Marinaro; IV&V Director, Dr. Butch Caffall

This says something fundamental about our philanthropic nature as a community, don't you think? This kind of generosity is part of the character of West Virginians and the culture of our State. The non profit organizations here all have such focused missions—whether it be food pantries for those who are hungry or the many services for those in great financial or medical need or the work being done with at-risk youth throughout the north-central region. You can look at what you contribute, not only in dollars and cents, but as a true extension of their good works. You can feel truly significant as a presence in an area where so many volunteers are attracted to these important missions—the missions drive the generosity—and the generosity empowers the volunteers. We on the Appropriations Committee are all about empowerment. I am especially focusing my concern on high risk youth, so I join you in your concern for those who are at risk in the counties of north central West Virginia.

Beyond the specific charitable contributions we are here to talk about today, the federal presence in our area is, in great part, the foundation of the diversification of the West Virginia economy. Twenty-five years ago the great need for economic diversification was a huge issue. While the rest of the country was being pulled out of recession by strategic military spending, West Virginia was in a depression that Senator Byrd and I focused our efforts on relieving by a strategy of bringing greater opportunities for government service to our state.

In the intervening years there has been a sea change. That sea change has meant that the federal presence in our state and particularly in this region has been a boon to the economy and has greatly enhanced the quality of life. Multiplying federal dollars has brought sustenance to the high tech industry in software development, high tech invention, aero space, academia, and research.

Throughout the history of West Virginia those who have served our government have improved the quality of life in our State. As a member of Congress I am proud to be a federal employee representing those of you who work so hard to make significant contributions to our national missions and significant contributions to the welfare of our communities through your generous giving."

Speaking of Generosity...

"As always, the Facility has shown a tremendous amount of generosity by supporting this year's Back to School Supply Giveaway Program at Scott's Run Settlement House. Although the specific number of students that the Facility equipped with school supplies is not available, it is safe to say that we contributed to about 60 kids this year (through a combination of actual supplies and money donated (Thank you Steve Pukansky and the Annual Golf Event and thank you Melissa Bodeau). This is truly a generous bunch, thank you very much!" *Marcus Fisher*

"The Fairmont Soup Opera thanks you all! They were extremely grateful for the generosity of the NASA facility. I counted over 25 grocery bags full of food that will help them stretch their resources through this season." *Darilyn Dunkerley*

Women's Mentoring Day

Meagan Carrier

On July 20th, the NASA IV&V Civil Service Women's Mentor Program began with meet and greet presentations, lunch and one-on-one mentor/mentee meetings. This voluntary program is designed to provide information, encouragement and support to the women of the IV&V civil service staff. The Mentors, have generously agreed to donate their time and resources, include Associate Director of GSFC and acting CFO, Nancy Abell, Associate Director for Safety and Security at GSFC, Judith Bruner and Executive Director for the Missile Defense Agency, Dr. Patricia Sanders.

Left to Right: (front)Lisa Montgomery, Kat Millson, (back) Melissa Bodeau, Donna Ozburn, (center) Dr. Patricia Sanders, Judith Bruner, Nancy Abell, (front) Kaci Reynolds, Delma Moore, (back) Christina Moats, Meagan Carrier, Natlie Alvaro

Each staff member has been assigned to a specific mentor. Mentees have an opportunity to receive feedback on strengths, shortcomings and possible impacts on career choices or aspirations. Since the kick off, mentees have already begun building relationships with their mentors through individual meetings and phone conversations. Mentors offer insight about their own work experience as well as information, advice and access to networks that may not otherwise be available.

Ms. Nancy Abell is Associate Director at Goddard. Nancy has served GSFC for almost forty years, starting her career as a summer intern. She has extensive experience in resources and financial management at the Center including serving as Chief Financial Officer for nine years prior to her current position. Ms. Abell became a senior analyst in the Office of Comptroller and was responsible for independent review, assessment, and analysis of programmatic and resources requirements for major Goddard programs. She was named Chief of the Administration and Resources Management Office in the Space Sciences Directorate and served as senior resources authority for the Directorate. Later she was named as the Center's Deputy Comptroller until she took the position of CFO.

Dr. Butch Caffall; Judith Bruner

Ms. Judith Bruner began her career at GSFC in 1989. She has held numerous positions including, Implementation Manager of the Earth Observing System (EOS) Mission Operations Center, Branch Head for Spacecraft Control Center Branch of the Mission Operations Division in the Mission Operations and Data Systems Directorate, Director's staff as the Manager of Wallops Mission 2000, the NASA Solar and Heliospheric Observatory (SOHO) Program Manager, Acting Director of the IV&V Facility, Acting Deputy Director of the Office of Systems Safety and Mission Assurance, among other duties. Currently, Ms. Brunner is the Assistant Director for Safety and Security and serves as the GSFC focal point for Center-wide integration and oversight for all activities related to safety and security, both programmatic and functional.

Dr. Patricia Sanders is the Executive Director for the Missile Defense Agency (MDA). In this position, she serves as the MDA Director's senior advisor on matters related to all Agency operational and management functions. Dr. Sanders serves as a key interface to the Office of the Secretary of Defense (OSD), the Services, and members of Congress. She is the senior Agency official in matters concerning civilian personnel and also acts on behalf of the Director for a variety of tasks as delegated. Some previously held positions include, Deputy Director, Ballistic Missile Defense System (BMDS) Integration and System Executive Officer for Ballistic Missile Defense. She is a seasoned member of the senior executive services with extensive experience in the Department of Defense. She has served as Director of Land Forces in the Office of the Assistant Secretary of Defense for Program Analysis & Evaluation and as Staff Specialist for the Director of Operational Test & Evaluation. Dr. Sanders is a Fellow of the American Institute of Aeronautics and Astronautics (AAIA). She places a high priority on mentoring and encouraging future leaders.

The highly motivated mentees are looking forward to gaining insight from three of federal government's most intelligent, hard working and successful women. They consider this to be a priceless opportunity to reap the benefit of the experiences of such women.